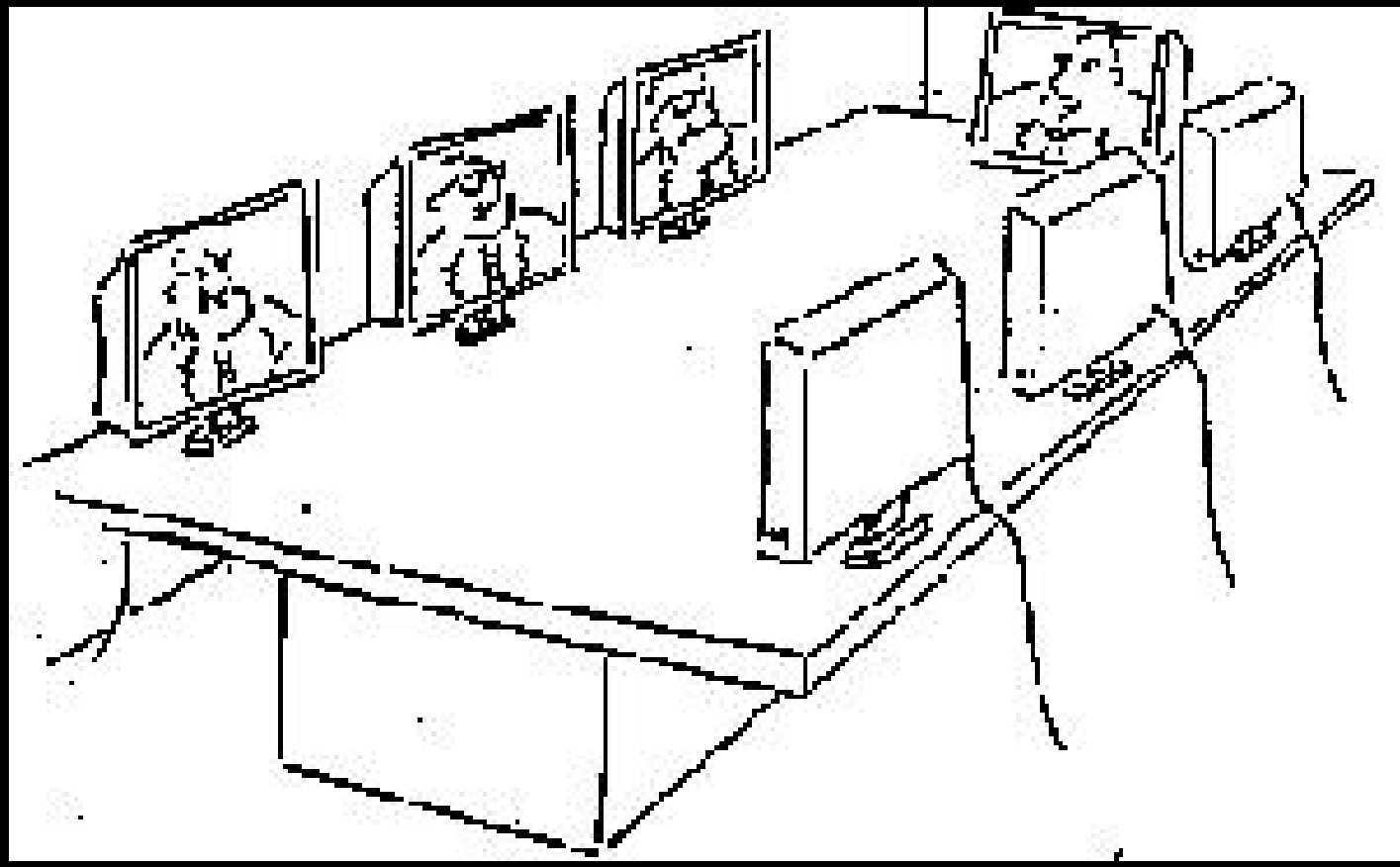


Success Through Failure:

Benefiting from Lessons Learned in Virtual Collaborations at the NASA Astrobiology Institute

Estelle Dodson, NASA Ames Research Center
Kdodson@mail.arc.nasa.gov

Outline of Talk

Part I

- **What is NAI?**
- **History of collaboration technologies at NAI**
- **Evolution of the approach**
- **Successes and what was involved**

Part II

- **Effects of tools on communication: choosing the right tools**
- **Best practices for virtual meetings**
- **Take home message**
- **Future dreams…**

What is the NASA Astrobiology Institute?

A virtual institute consisting of PIs and their teams from 16 universities and organizations, over 700 members throughout the world.

- **Ames Research Center**
- **Caltech**
- **Carnegie Institution of Washington**
- **Goddard Space Flight Center**
- **Indiana University**
- **Marine Biological Laboratory**
- **MIT**
- **Montana State University**
- **Pennsylvania State University**
- **SETI Institute**
- **University of Arizona**
- **University of California, Berkeley**
- **University of California, Los Angeles**
- **University of Colorado, Boulder**
- **University of Hawaii, Manoa**
- **University of Wisconsin**

Communities of Practice

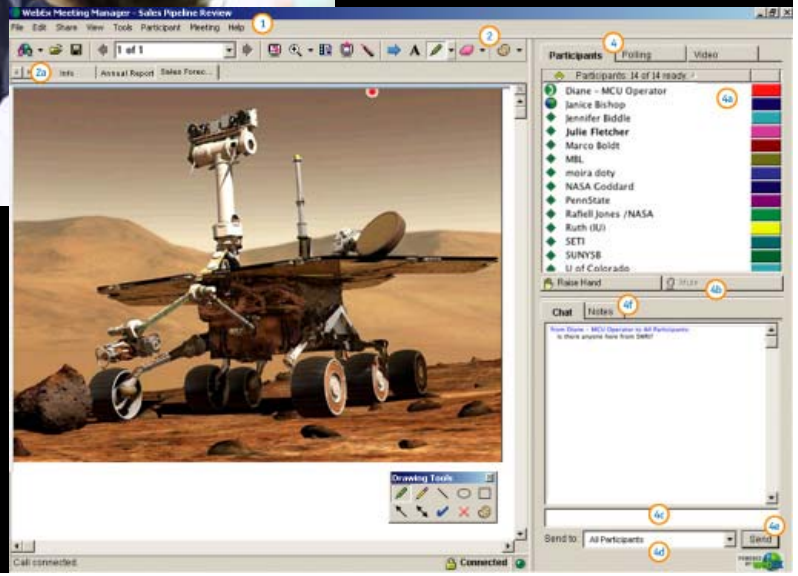
"Groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an on-going basis"

– Etienne Wenger (2002)

New Approaches and Ideas

- Surveys
- Needs assessment
- ITWG
- Virtual Office Hours (sandbox)
- One-on-one and group training
- Providing a suite of tools
- Cheat sheets
- Project-based collaboration
- Adoption planning

Virtual Seminars and Meetings



Resistance…
even from technophiles

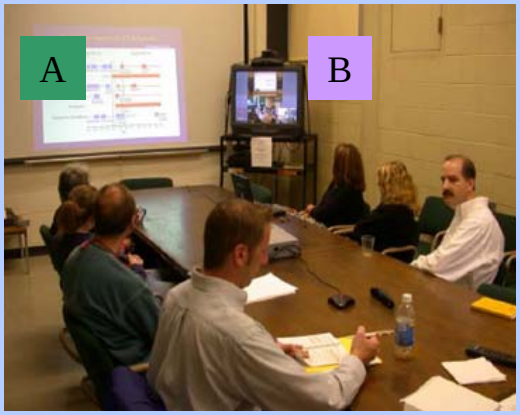
"Why would you want to use this half-baked technology to replace something that is working perfectly well?"

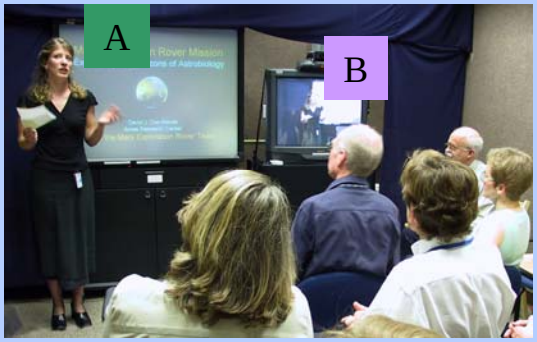
– Uwe Rossbach, IT Working Group member, Michigan State University

Methane on Mars Workshop

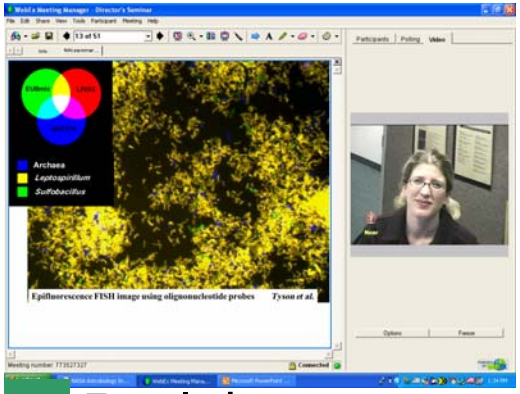
Collaboration Technologies

Two-way interactive meetings…





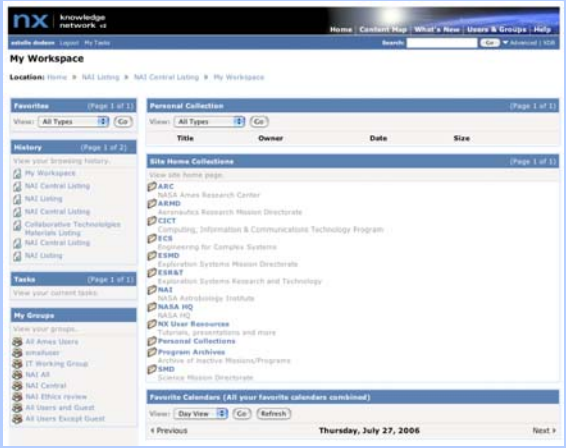
Consisting of…

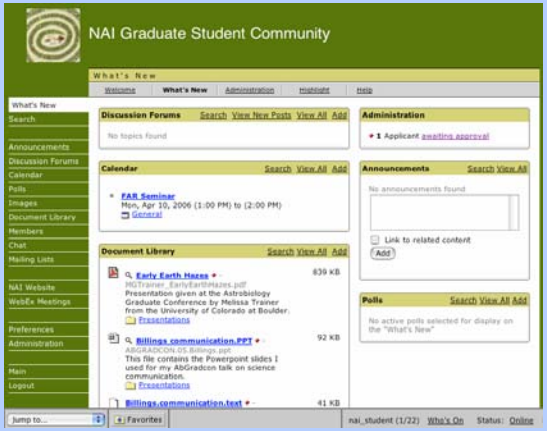


A Real-time meeting Software

B Videoconferences

Followed up with shared online systems and communities





BioMarkers

Virtual Scientific Collaboration: Jonathan Lunine, Tom Quinn, Sean Raymond

- Three person science collaboration
- Geographically distributed project team
- Launched with in-person discussion
- Follow up with videoconferencing
- Data sharing using a web-based collaborative work space
- Published joint paper: "Making other Earths: Dynamical Simulations of Terrestrial Planet Formation and Water Delivery"

Virtual Astrobiology Class

- Weekly class meetings with participants from 3 universities
- Presenters/slides accessible via Polycom vidoeconferencing and WebEx data sharing
- Live discussion via Polycom audio connection

Jonathan Lunine, University of Arizona

- "We could see each others facial reactions, which plays more of a role in discussing scientific problems than one might imagine... my view is that our 3-way collaboration was greatly strengthened by the visual cues the videocon capability gave us. We're on to paper II."

Tom Quinn, University of Washington

- "The video conferencing was particularly useful in the planning stage of the research, where interaction was critical for responding to each others ideas. I thought it was significantly better than a phone call when more than two people were interacting."

Success Stories

- Methane on Mars half-day workshop: three sites, 25 participants
- Astronomy Focus Group two-day meeting; three sites
- BioMarkers two-day workshop: two sites, over 15 participants
- EPO CAN-4 Review: three days, 8 sites, 10 people, **cost savings of approximately 20K**
- Monthly Executive Council meetings: 16-20 sites, 20-40 participants
- Monthly EPO meetings: 8-12 sites, 8-16 participants
- Monthly ITWG meetings: 6-10 sites, 6-20 participants
- Virtual Planetary Laboratory at JPL weekly team meetings
- Seminar series: two virtual seminars per month and annual student seminar, 6-30 sites, 20-120 participants
- Monthly science journal club, 4 sites, 7 participants
- NASA Mission Briefings to NAI PI's: half-day, over 30 participants

Benefits of NAI Participation: a few quotes

- Engaging in “collaboration which would not otherwise have been fostered”
- “Interdisciplinary research with colleagues on major and basic scientific problems”
- Opening up “whole new areas of research that I knew little about”
- “NAI has made it almost socially acceptable to collaborate with your competitors”
- “Once I had become familiar with the situation at hand, doing so was quite exhilarating”

Best Practice for Hosting a Virtual Meeting

Preparation for the Meeting:

- Send background information, agenda, and connection instructions as early as possible. Make your agenda more detailed than usual, remember remote participants may not be as up to speed on a topic as your local group. Remind participants to print out instructions and bring it to videoconference room. Include participant roles so people know what is expected of them. Post this information on a shared website if possible.
- Always provide a back-up plan, for example, if videoconference fails, have a conference call number in reserve.
- Schedule a practice session two days beforehand for new users. This allows you time to troubleshoot the network if they can't connect. Test **all** the technologies that will be used.
- Have sites display their names either through the video capability or as a physical sign in view of the camera.
- Emphasize the importance of adaptability (patience) when using technology.

During the meeting:

- Connect at least 15 minutes early, **do not** wait for the meeting start time to connect.
- Review technology and protocols at the beginning of the meeting such as muting microphones, use of chat rooms, identifying themselves when they speak etc.
- When using a videocamera, zoom in as tight as possible on the speaker. The value added of videoconferencing is being able to see facial expressions for non-verbal cues and feedback.
- Have sites introduce themselves and anyone who may be with them. If it is a new group, have each person give a brief introduction. In a large or previously established group, read a list of participants. It's important for people to know who is participating so they don't make inappropriate remarks and undermine group trust.
- Avoid sarcasm, it does not come across the same way as in-person meetings and you may alienate participants.
- Elicit comments/agreements/questions. Remote conferencing lacks the non-verbal feedback of face-to-face meetings. It's important to facilitate that extra communication. Be very explicit, ask the group or individuals if they understand or agree with what has been said. Ask specific individuals for feedback and comments.
- Delegate the technical tasks (note taking, chat rooms, troubleshooting). The meeting leader should not try to run the technologies.
- Do not say or type anything you would not want everyone to hear/read. Mistakes are made, it is easy for a microphone to be open or a chat to go to the wrong person which could be detrimental to group dynamics.

After the meeting:

Immediately email and post meeting minutes and action items. Ask for confirmation from people responsible for action items.

Handout
“Strategy for Selecting the Best Medium for Virtual Collaboration”

Please see page xvi (pdf page 18) from RAND Report, “Challenges in Virtual Collaboration”, Lynne Wainfan and Paul K. Davis. Can be downloaded at http://www.rand.org/pubs/monographs/2004/RAND_MG273.pdf

It’s not “one size fits all” or “build it and they will come”… Human factors are as important as the technologies themselves…

Companies and organizations must address:

- Choosing the right solutions and/or providing multiple solutions end-users can customize for their needs
- Integrating multiple solutions and tools
- Training and transition planning
- Adoption strategies
- Marketing, “evangelizing”, early adopters
- Guidelines on what tool to use when (for example when to use phone vs. video)
- Lessons learned and best practices
- Trust and security (is the software consistent and reliable?)

Future interests and ideas

- Blogging and microblogging as knowledge management
- 3-D Immersive environment such as Second Life, but not fantasy based, eventually requiring identity verification
- Expert locators, journal publications, shared bookmarks and discussions forums all combined with semantic technologies. A science based “Facebook”
- Interoperability and standards